THE URBAN WILDLANDS GROUP, INC.
P.O. BOX 24020, LOS ANGELES, CALIFORNIA 90024-0020, TEL (310) 247-9719

Response to the Draft Programmatic Environmental Assessment of the Antenna Structure Registration Program

Travis Longcore, Ph.D.
November 1, 2011

These comments respond to selected aspects of the Draft Programmatic Environmental Assessment (PEA) prepared by the Federal Communications Commission for the Antenna Structure Registration Program. I concentrate on the elements of the PEA that reference my research. These comments seek to correct various errors in the characterization of my research, identify some egregiously illogical argumentation about whether impacts of the program are significant, and point out a double standard regarding whether or not writings that are not peer reviewed will be given "significant weight."

Mischaracterizations in the PEA

PEA, Page 4-13

There is some uncertainty associated with both total migratory bird populations and individual species populations. As Longcore et al. (2011b in preparation) acknowledged, the population estimates they used may vary by as much as an order of magnitude. In addition, population levels vary from year to year and geographically.

This mischaracterizes the source of estimates of population size. Our text read:

> The method of calculating these estimates from breeding bird surveys (Rosenberg & Blancher 2005) has been well received, but has acknowledged limitations (Thogmartin et al. 2006). These population estimates have associated measures of accuracy and precision. For the 20 species ranked as highest annual percent mortality in our analysis, nearly

all estimates of accuracy for land birds are described as either "likely to be well within correct order of magnitude, often within 50% of true number" or "in correct order of magnitude" (Rich et al. 2004).

The PEA incorrectly cites us as the source of the level of error in the population estimates (it should be Rich et al. 2004) and it fails to acknowledge that for the species most impacted by towers, the accuracy of these estimates is higher.

PEA, Page 4-13

There is also considerable uncertainty associated with estimating avian mortality caused by communications towers. Several of the existing studies describe extreme episodic events of limited geographic scope. Longcore et al. (2011a and 2011b, both in preparation) conducted a meta-analysis of existing studies, many of which involved only large, one-time bird kills at individual towers. As a result, the conclusions drawn by many of the existing studies are not based on typical conditions at a majority of tower sites.

This also mischaracterizes the state of the data used in our two papers. The first manuscript contains absolutely no studies that involved "only large one-time bird kills at individual towers." The height mortality regression included only towers with more than a year of monitoring and the average length that towers were monitored was 7.2 years (when counting each fall season as 0.75 years and each spring as 0.25 years) and half of the towers were monitored 2 or more years. The second manuscript on species composition included records of any duration but included a statistical adjustment that gave more weight to the records that reported more species (and were longer, since species number and study length are correlated).

The PEA should be revised to correct these two mischaracterizations and strike the final conclusive, but unsupported, sentence. In fact, the towers that have been studied for mortality often were not identified as causing mortality prior to being studied. This is the case with the long-term study at the WCTV tower; it had been selected for surveys prior to construction (R. Crawford, pers. comm.). All of the studies in the Travis (2009) study and the Michigan Tower study were selected without knowledge of prior avian mortality, yet the results from these towers fit very neatly within the predicted relationships.

PEA, Page 4-13

There are not adequate data available that quantify the impacts of various sources of mortality on individual bird species. Studies suggest that fatality rates at communications towers are not similar for all migratory bird species and that there may be a disproportionate adverse effect on certain species (e.g., Graber 1968, Longcore et al. 2011b in preparation). Some researchers suggest that this adverse effect may be biologically significant for some species such as Bay-breasted Warbler, Swainson's Warbler, Harris' Warbler, and Black-throated Warbler (Longcore et al. 2011b in preparation). However, the data are inconclusive and the importance of these mortality sources at a species level is not well understood. In a draft report, Longcore et al. (2011b in preparation) estimate that towers may disproportionately kill certain bird species when compared to other sources of mortality. For 12 species, they estimate that mortality at towers is greater than 1 percent of the total population size and may have an impact on population viability. They further state that one of these species is endangered, and an additional eight species are Birds of Conservation Concern. However, as noted above, their results were based on a meta- analysis of existing studies that were not designed to address species-specific effects. In addition, the analysis carries an inherent bias by including an overrepresentation of extreme episodic events that skew the mortality estimates.

The PEA does not provide any evidence that the analysis is biased toward overrepresentation of extreme episodic events, as discussed above. Only seven (18%) of the 38 studies included in the mortality–height regression are known to be selected because mortality had been previously observed at the tower, and even then researchers had no knowledge of whether the mortality was greater than average. It is not clear why another 5 towers were selected. The remaining 26 towers (68%) were studied without any prior knowledge of mortality and many were selected either at random, or incidental to other studies (e.g., wind farm scoping studies or required mitigation studies). The PEA grossly errs in its interpretation of the content and purpose of the meta-analysis represented in this paper.

As for the proportions of birds killed in each Bird Conservation Region there are explicit approaches in the methodology that offset the influence of any extreme episodic events. These include summing all mortalities at a single site over time (rather than averaging proportions of

single events at the same site) and weighting the proportions of birds killed at a site by the number of species recorded. The net effect of these calculations is to offset any influence of single extreme events, a fact the preparers of the PEA did not discern.

This text should be modified to describe accurately the way in which the data were analyzed. This correction should also be made on page 4-23.

PEA, Page 5-11

Towers that cause the most mortality to migratory birds are those that exceed 1,000 feet (305 meters) AGL (Longcore et al. 2011a, in preparation)…

This is not entirely accurate. By our calculations, towers greater than 300 m cause 69% of annual mortality. Since this number is known, it should be used in place of the characterization "most." To address 85% of mortality, towers greater than 150 m must be considered.

PEA, Page 5-17

Longcore et al. (2011b in preparation) estimate that 95 percent of tower mortality consists of passerines (songbirds), and that among passerines, mortality rates are highest for warblers, vireos, sparrows, and thrushes. The authors suggest that mortality may be more than 1 percent of the species population for 12 species (range 1-8 percent), eight of which are warblers. One of the 12 is endangered, and eight are birds of conservation concern. However, as noted above in Section 4.6.3.1, Longcore et al. (2011b in preparation) results were based on a meta- analysis of existing studies that were not designed to address species-specific effects. In the absence of peer review, the conclusions that Longcore et al. draw from these studies are not accorded significant weight. In addition, the analysis carries an inherent bias by including an overrepresentation of extreme episodic events that skew the mortality estimates. Therefore, the evidence is insufficient to support a finding that the effects of towers on individual species of migratory birds may be significant.

We have addressed several of these unfounded criticisms above. It does not matter that the studies in the meta-analysis were not conducted "to address species-specific effects." In truth, increasing knowledge about the impacts of towerkill was the specific intent of many of the

researchers, but this does not matter, because the raw data do not depend on the intent of the researchers. Nevertheless, one need not consider the conclusions drawn in our manuscript to reach the conclusion that communication towers result in significant biological impact within the understanding of the National Environmental Policy Act (NEPA).

Species-specific Effects

The FCC will probably receive a paper by Arnold and Zink (2011) that purports to find that avian mortality at communication towers does not affect population trajectories. Arnold and Zink (2011) performed an analysis of the proportion of birds killed at towers and regressed the relative risk of collision against 30-year population trends calculated from Breeding Bird Survey data. They concluded from this simple regression that tower mortality had no discernable effect on population trajectory and claimed that their methods had statistical power to detect as little as a 4.1% contribution to the observed trends. Their results are suspect on several grounds. First, they used a flawed secondary data source (Shire et al. 2000). Although groundbreaking at the time of release, the unpublished Shire et al. report did not have exhaustive coverage of the literature available at the time, contained tabulation errors, and has become dated. My colleagues and I have assembled these records from original sources for tower studies in North America; we have recorded 243 species from roughly 264,000 specimens, significantly more than was analyzed by Arnold and Zink from the Shire et al. data (compare to 180,832 mortalities of 188 species). Arnold and Zink's mortality proportions are also suspect because they do not account for regional variation in mortality (a glaring oversight) or provide a mechanism to combine studies of different lengths in a way that avoids large datasets overwhelming small ones, thereby making the wildly unrealistic assumption that proportion of species of birds killed at every single tower in North America is exactly the same. Furthermore, even if a single-factor regression were an appropriate approach, their regression of collision risk against population trends included many trends that were not statistically significant and the regression did not incorporate the known errors in either the population estimates or in the proportions of birds killed. In short, many of my colleagues and I gravely doubt the ability of their method to definitively identify the cumulative impacts of avian mortality at towers and buildings, and make no such sweeping claim for our own research either. The FCC should fully consider these weaknesses in the event the Arnold and Zink paper is presented as evidence that tower mortality is of no biological consequence.

The FCC should also bear in mind that discernable population-level impacts are not a necessary prerequisite to identifying significant adverse impacts under NEPA. Violation of resource protection statutes, such as the Migratory Bird Treaty Act and Bald and Golden Eagle Protection Act are themselves identifiable significant adverse impacts under NEPA that require full disclosure and mitigation.

Analysis Framework is Intellectually Bankrupt

PEA, Page x.

Current annual avian mortality from existing communications towers is estimated at approximately 5 million birds, the majority of which are migratory birds. Assuming that approximately 2,800 new towers would be constructed annually under the existing ASR Program, avian mortality would increase to an estimated 6.6 million birds by the year 2021 due to collisions with communications towers. While this number is large and constitutes a major impact, it is only 0.05 percent of the overall U.S. bird population, which is estimated at 10 billion birds. Furthermore, when evaluated in context with other sources of avian mortality, towers cause approximately 0.2 percent of annual avian mortality. Thus, in the national context of overall migratory bird abundance and other, greater forces to which migratory birds are subject, the relative impact of communications towers is small. In addition, the available scientific information does not support a finding that tower collisions may have a significant impact on any particular species. Therefore, the impact to migratory birds under the No Action Alternative is not significant.

It is scientifically meaningless and intellectually bankrupt to evaluate impacts to "migratory birds" as a whole or to express mortality from towers as a proportion of all bird mortality. This is clearly laid out in our manuscripts and was presented at the 2010 American Ornithologists' Union conference (Longcore et al. 2010). For the record, here are the relevant paragraphs:

> For evaluation of the biological significance of mortality, species or populations should be the unit of analysis in most instances. For example, barbed wire fences kill a relatively small proportion of birds compared with such hazards as windows and feral and free-roaming cats, but barbed wire fences are a biologically significant source of mortality for whooping cranes, an endangered species (Allen & Ramirez 1990). Higher taxonomic

groups, such as families, or even guilds that cut across taxonomic groups may be the appropriate unit of analysis if something is known about the conservation status of these units as a whole. For example, oil pits where slurry is disposed of at energy facilities kill an estimated 500,000–1,000,000 birds per year (Trail 2006). Interpretation of this number was made possible by documenting mortality at oil pits of 162 species, of which 63% were ground-feeding birds, including several species of conservation concern (Trail 2006). Mortality at communication towers, up to this point, has been a conservation issue because the species predominantly killed at towers are neotropical migrants, especially warblers, which are of conservation concern as a group. Beyond this general observation, [until our investigation] only crude estimates have been made of the species composition of the millions of birds killed annually at communication towers (Arnold & Zink 2011; e.g., simple sums of birds killed without regard for geographic variation, Shire et al. 2000).

Advocates for the tower industry (and indeed also for the wind industry) frequently compare the mortality at towers (or turbines) to other sources of mortality for birds and argue, implicitly or explicitly, that those sources that kill more total birds are more important by virtue of sheer numbers alone (e.g., Woodlot Alternatives 2005). Our analysis shows that this approach is flawed because it lumps all birds together without regard for their status as rare or common. It matters which species are killed and numbers that may appear low when in the context of total human-caused avian mortality can still be significant for the affected species. This same approach should be used for other sources of avian mortality, such as wind power, where aggregate mortality numbers appear to be insignificant compared with other sources, but analysis for individual species can indicate significant impacts (Carrete et al. 2009).

It is absolutely irrelevant that towers kill 0.05% of total United States bird populations or to suggest that this statistic is relevant to impact analysis under NEPA. In the PEA, the FCC acknowledges that not all birds are killed in equal proportions at towers. By acknowledging this fact, the FCC precludes itself from drawing any conclusions from any calculation of tower mortality with reference to all birds. It is also undisputed that different human-caused mortality sources kill different groups of species, so the proportion of human-caused mortality represented by towers is

similarly without analytical relevance to the question of whether the proposed action is significant under NEPA. This is basic logic that does not require acceptance of our manuscripts for the FCC to consider. The conclusion that these statistics can be interpreted as meaning that the ASR program has no significant adverse impacts is simply wrong.

Selective Exclusion of Conclusions in Literature Not Peer Reviewed

The PEA states that, "In the absence of peer review, the conclusions that Longcore et al. [2011b] draw from these studies are not accorded significant weight." The standard that certain sources are not afforded "significant weight" is applied only to our manuscripts, notwithstanding that the approaches and results in them were accepted to and published as an abstract at the 2010 American Ornithologists' Union conference (Longcore et al. 2010), which is certainly more rigorous review than undergone by the websites that the FCC includes in the PEA as legitimate sources. The PEA cites and does not disclaim many other conference proceedings and unpublished works that are not published in the peer-reviewed academic literature, and in fact relies upon their conclusions. No fewer than 41 references in the PEA are to sources that are not published in peer-reviewed academic sources. It is suspicious that only the conclusions in our paper have been singled out for question, when the conclusions of other sources not published in the academic literature are accepted without question and indeed, even relied upon by the FCC to draw its conclusions.

For example, the PEA relies on Blancher et al. (2007) for its numbers of land birds in the United States. This is not a source published in the peer-reviewed scientific literature. The PEA refers to "Derby et al. 2002" but does not even include this source in the bibliography. It is presumably the following reference:

> Derby, C., W. Erickson, and M.D. Strickland. 2002. Protocol for monitoring impacts of seven un-guyed, unlit cellular telecommunication towers on migratory birds and bats within the Coconino and Prescott National Forests, Arizona. Tech. Report prepared for American Tower Corporation.

Despite being an unpublished report prepared for the tower industry, the PEA does not include any statement about not giving its conclusions "significant weight." Our manuscripts could easi-

ly be released as a technical report (which this source is) and be granted equal weight as this report is granted in the PEA. If the PEA is to be consistent about what literature it will and will not give significant weight, all of the other conference presentations and unpublished reports must also be accompanied by a statement that they are not published in the peer-reviewed academic literature and their conclusions therefore cannot be afforded "significant weight." If this is not done, one can only conclude that the FCC is selectively downplaying the analysis and conclusions in our research because they are inconvenient to the conclusion that the FCC wishes to draw about the impacts of the ASR program.

Literature Cited

Allen, G. T., and P. Ramirez. 1990. A review of bird deaths on barbed-wire fences. Wilson Bulletin **102**:553–558.

Arnold, T. W., and R. M. Zink. 2011. Collision mortality has no discernable effect on population trends of North American birds. PLoS ONE **6**:e24708.

Carrete, M., J. A. Sánchez-Zapata, J. R. Benítez, M. Lobón, and J. A. Donázar. 2009. Large scale risk-assessment of wind-farms on population viability of a globally endangered long-lived raptor. Biological Conservation **142**:2954–2961.

Longcore, T., C. Rich, P. Mineau, B. MacDonald, D. G. Bert, L. M. Sulivan, E. Mutrie, S. A. Gauthreaux, Jr., M. L. Avery, R. L. Crawford, A. M. Manville, II, E. R. Travis, and D. Drake. 2010. An estimate of avian mortality at communication towers in North America by species and region. Cooper Ornithological Society/American Ornithologists' Union/Society of Canadian Ornithologists 2010 Joint Meeting, San Deigo, California.

Rich, T. D., C. J. Beardmore, H. Berlanga, P. J. Blancher, M. S. W. Bradstreet, G. S. Butcher, D. W. Demarest, E. H. Dunn, W. C. Hunter, E. E. Iñigo-Elias, J. A. Kennedy, M. A. M., A. O. Panjabi, D. N. Pashley, K. V. Rosenberg, C. M. Rustay, J. S. Wendt, and T. C. Will. 2004. Partners in Flight North American landbird conservation plan. Cornell Lab of Ornithology, Ithaca, New York.

Rosenberg, K. V., and P. J. Blancher. 2005. Setting numerical population objectives for priority landbird species. Pages 57–67 in C. J. Ralph, and T. D. Rich, editors. Proceedings of the 3rd International Partners in Flight Conference Vol 1; 2002 March 20–24; Asilomar, California. Pacific Southwest Research Station, Forest Service, Albany, California.

Shire, G. G., K. Brown, and G. Winegrad. 2000. Communication towers: a deadly hazard to birds. American Bird Conservancy, Washington, D.C.

Thogmartin, W. E., F. P. Howe, F. C. James, D. H. Johnson, E. T. Reed, J. R. Sauer, and F. R. Thompson, III. 2006. A review of the population estimation approach of the North American Landbird Conservation Plan. Auk **123**:892–904.

Trail, P. W. 2006. Avian mortality at oil pits in the United States: a review of the problem and efforts for its solution. Environmental Management **38**:532–544.

Woodlot Alternatives. 2005. Technical comment on *Notice of Inquiry Comment Review, Avian/Communication Tower Collisions, Final* (Avatar et al. 2004). Report prepared for CTIA - The Wireless Association, The National Association of Broadcasters, and PCIA - The Wireless Infrastructure Association. Woodot Alternatives, Inc., Topsam, Maine.